COURSE OVERVIEW PE0980
Safety in Process Design

Course Title
Safety in Process Design

Reference
PE0980

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	May 25-29, 2025	Crowne Meeting Room, Crowne Plaza Al Khobar, KSA
2	September 28-October 02, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	December 07-11, 2025	Meeting Plus 9, City Centre Rotana, Doha Qatar

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of safety in process design. It covers the implementation of safety concepts, methods and standards in process design including redesign of existing processes for safety considerations; managing process safety including risk and process hazard analysis; and minimizing the risk of process hazards in the design of oilfield processing equipment and facilities.

Further, the course will also discuss the various types of corrosion; the different types of health hazards including chemical hazards, noise, radiation, thermal stress; the evaluation of reactive chemical hazards by using experimental screening, reaction hazard index and hydro-peroxide; the equipment design and operation; the strategies to prevent fires and explosions; and the issues associated with the process design of a facility and in developing "inherently safer" designs.

During this interactive course, partcipants will learn to eliminate hazards through process design; identify human error including unintentional errors, misleading information and poor design; improve the techniques used in the modification process used in process design; apply the various methods in the prevention of incidents; employ risk assessment as applied in process design and recognize its importance; and demonstrate how process design, management of change, and inadequate safeguards have all contributed to major accidents.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on safety requirements in process design including process hazard evaluation, process equipment design and operation
- Implement the safety concepts, methods and standards in process design including redesign of existing processes for safety considerations
- Manage process safety including risk and process hazard analysis
- Minimize the risk of process hazards in the design of oilfield processing equipment and facilities
- Identify the various types of corrosion and discuss the different types of health hazards including chemical hazards, noise, radiation and thermal stress
- Evaluate reactive chemical hazards by using experimental screening, reaction hazard index and hydro-peroxide
- Review the equipment design and operation and improve the strategies to prevent fires and explosions
- Recognize issues associated with the process design of a facility and in developing “inherently safer” designs
- Eliminate hazards through process design and explain human error including unintentional errors, misleading information and poor design
- Improve the techniques used in the modification process used in process design and apply the various methods in the prevention of incidents
- Employ risk assessment as applied in process design and recognize its importance in the process industry
- Analyze case studies that discuss incidents in the process industry and demonstrate how process design, management of change, and inadequate safeguards have all contributed to major accidents

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive “Haward Smart Training Kit” (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course is intended for those who are managing and performing process design and process hazard evaluations or risk assessments for operating facilities or are coordinating project activities. Further, the course is suitable for new graduates who wish to gain an understanding of practical process design issues.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Kyle Bester is a **Senior Mechanical & Process Engineer** with extensive years of practical experience within the **Oil & Gas**, **Power & Water Utilities** and other **Energy** sectors. His expertise includes **Bearing & Bearing Failure** Analysis, **Centrifugal**, **Reciprocating** & **Screw** Compressor, **Gas Turbine** Repair, **Pump Installation & Operation**, **Compressors & Turbines** Troubleshooting, Coupling, Gear Boxes, Bearings & Lubrication, Mechanical Seals, Bearings & Seals, **Pressure Vessel** Design & Analysis, **Steam & Gas Turbine**, **High Pressure Boiler** Operation, **Compressors** Operation & Maintenance, **Pipe** Maintenance & Repair, **Centrifugal & Positive Displacement Pump**, **Rotating Machinery**, **PD Compressor & Gas Engine** Operation & Troubleshooting, **Hydraulic Tools & Fitting**, **Mass & Material Balance**, **Water Distribution & Pump Station**, **Tank Farm & Tank Terminal**, **Process Piping** Design, **Stack & Noise** Monitoring, **HVAC & Refrigeration** Systems, **Condition Monitoring** System, **Maintenance Planning & Scheduling**, **Maintenance Shutdown & Turnaround**, **Maintenance Audit** Best Practices, **Maintenance & Reliability** Management, Reliability, Availability & Maintainability (**RAM**), **Root Cause** Analysis, **Reliability-Centered Maintenance** (**RCM**), **Reliability Engineering Analysis** (**RE**), **Root Cause Analysis** (**RCA**), **Asset Integrity Management** (**AIM**), **Reactive & Proactive** Maintenance, **Mechanical & Rotating Equipment** Troubleshooting & Maintenance, **Maintenance Management & Cost Control**, **Operation of the Hydrocarbon** Process Equipment, **Fired Heaters**, **Air Coolers**, **Heat Exchangers**, **Crude Desalter**, **Pressure Vessels & Valves**, **Flare**, **Blowdown & Pressure Relief Systems** Operation, **Separation Techniques**, **Bulk Liquid Storage** Management & **Tanks Cleaning**, **Ammonia Manufacturing** & Process Troubleshooting, Process Equipment **Design**, Process Reactors and **Chemical** Engineering. Further, he is also well-versed in **Water Reservoir**, **Water Tanks**, **Water Pumping** Station, **Water Distribution** System, **Water Network** System, **Water Pipes & Fittings**, **Water Hydraulic** Modelling, **Water Storage Reservoir**, **Reservoirs & Pumping** Stations Design & Operation, **Pumping** Systems, Interconnecting **Pipelines**, **Water Network Hydraulic** Simulation Modelling, **Water Supply** Design, **Water Balance Modelling**, **Water Distribution Network**, **Water Network** System Analysis, **Water Forecasts** Demand, **Water Pipelines** Materials & Fittings, **Water Network** System Design, Pump Houses & Booster Pumping Stations, **Potable Water Transmission**, **Water Distribution Network**, Districts Meters Areas (DMAs), **Water Supply & Desalination Plants** Rehabilitation, **Water Reservoirs & Pumping Stations**, **Water Network System** Extension, Water Network System Replacement & Upgrade, **Water Networks** Optimization, **Water Supply & Distribution** Systems Efficiency & Effectiveness, **Pipe** Materials & Fittings, **Service Reservoir** Design & Operation, **Pipes & Fittings**, **Water Network** System Design & Operation, **Supply Water Network** Rehabilitation, **Water Loss** Reduction, **Main Water** System Construction, **Main Water Line** Construction, Transmission & Distribution **Pipelines**, **Water Distribution** Design & Modelling, **Water Supply** System, Oilfield **Water Treatment**, Best Practice in **Sewage** & Industrial **Wastewater Treatment** & Environmental Protection, **Water Distribution** Design & Modelling, **Desilting**, Treating & Handling Oily **Water**, **Water Chemistry** for **Power Plant**, **Water** Sector Orientation, Environmental Impact Assessment (**EIA**). He is currently the **Part Owner & Manager** of Extreme Water SA wherein he manages, re-designed and commissioned a water and wastewater treatment plants.

During his career life, Mr. Bester has gained his practical and field experience through his various significant positions and dedication as the **Project Manager**, **Asset Manager**, **Water Engineer**, **Maintenance Engineer**, **Mechanical Engineer**, **Process Engineer**, **Supervisor**, **Team Leader**, **Analyst**, **Process Technician**, **Landscape Designer** and **Senior Instructor/Trainer** for various international companies, infrastructures, water and wastewater treatment plants from New Zealand, UK, Samoa, Zimbabwe and South Africa, just to name a few.

Mr. Bester holds a **Diploma** in **Wastewater Treatment** and a **National Certificate** in **Wastewater & Water Treatment**. Further, he is a **Certified Instructor/Trainer**, an **Approved Chemical Handler** and has delivered numerous courses, trainings, conferences, seminars and workshops internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

Al Khobar	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	**US$ 6,000** per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Process Safety Management*** *Risk ● Process Safety Management Systems ● Process Hazard Analyses*
0930 – 0945	*Break*
0945 – 1030	***Flammability*** *Sources of Ignition ● Fire ● Explosion ● Flammability ● Codes*
1030 – 1130	***Materials of Construction*** *Material Selection Process ● Metal Structure ● Properties ● Brittle Fracture*
1230 – 1245	*Break*
1245 – 1420	***Materials of Construction (cont'd)*** *Creep ● Thermal Expansion ● Fatigue ● Codes*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Corrosion*** *General Corrosion ● Hydrogen Effects ● Galvanic Corrosion ● Stress Related Corrosion ● Selective Attack ● Stray Current Corrosion*
0930 – 0945	*Break*
0945 – 1100	***Corrosion (cont'd)*** *Microbial Corrosion ● Intergranular Corrosion ● Fretting Corrosion ● Corrosion Fatigue ● Pitting/Crevice Corrosion*
1100 – 1230	***Health Hazards Awareness*** *Industrial Health Concepts ● Industrial Toxicology ● Chemical Hazards/Effects ● Occupational Exposure Limits ● Noise, Radiation ● Thermal Stress ● Ergonomics*
1230 – 1245	*Break*
1245 – 1420	***Class Exercise - Process Hazard Analyses***
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about that were Discussed Today and Advise Them of the Topics to be Discussed tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Evaluating Reactive Chemical Hazards*** *Managing Reactive Chemical Hazards ● Experimental Screening ● Reaction Hazard Index ● Hydro-peroxides*
0930 – 0945	*Break*
0945 – 1100	***Equipment Design & Operation*** *Inherent Safer Process Design ● Strategies to Prevent Fires and Explosions*
1100 – 1230	***Equipment Design & Operation (cont'd)*** *Piping Systems ● Relief Systems*
1230 – 1245	*Break*
1245 – 1420	***Class Exercise – Equipment Design***
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Plant Design & Operation*** *Elimination of Hazards Through Process Design*
0930 – 0945	*Break*
0945 – 1100	***Plant Design & Operation (cont'd)*** *The Human Error*
1100 – 1230	***Modifications*** *Hardware Modifications ● Other Modifications Affecting Plant Integrity: Case Studies ● Prevention of Incidents*
1230 – 1245	*Break*
1245 – 1420	***Overview of Risk Assessment*** *Risk Identification ● Risk Classification/Tolerance Criteria*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Supplementary Workshops*** *Case Study 1 Fire & Explosions at Formosa ● Case Study 2 Fire at Prixair*
0930 – 0945	*Break*
0945 – 1100	***Supplementary Workshops (cont'd)*** *Case Study 3 Bhopal ● Case Study 4 Flixborough*
1100 – 1200	***Supplementary Workshops (cont'd)*** *Case Study 5 Explosion at BP Refinery ● Case Study 6 Acetylene Explosion at ASCO*
1200 – 1215	*Break*
1215 – 1345	*Summary, Open Forum & Closure*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org